

PATENT ABSTRACTS OF JAPAN

(11)Publication number : **2002-192169**

(43)Date of publication of application : **10.07.2002**

(51)Int.Cl.

C02F 1/68

A23L 2/00

(21)Application number : **2000-397867**

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(22)Date of filing : **27.12.2000**

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(54) BEVERAGE USING SEAWATER AS RAW MATERIAL AND RAW MATERIAL WATER THEREOF

(57)Abstract:

PROBLEM TO BE SOLVED: To provide water easy to drink as compared with other mineral supply beverage, enhancing various numerical values (e.g.; cholesterol value) from an aspect of health related to diabetes or diseases related thereto, improving a blood flow becoming the root of many diseases and showing health promoting effect such as the improvement of atopic dermatitis by drinking.

SOLUTION: Water contains (1) sodium: not more than 200 mg/l, (2) magnesium: not less than 30 mg/l, (3) calcium: not less than 5 mg/l, (4) potassium: not less than 5 mg/l, (5) the sum total of zinc, copper, iodine, phosphorus, selenium, manganese and chromium: not less than 2.5 µg/l, (6) boron: not more than 1.5 mg/l, (7) sulfur present as a sulfate: not less than 10 mg/l and (8) the sum total of nitrogen present as a nitrate, nitrogen present as a nitrite, phosphorus present as phosphate and silicon present as a silicate: not less than 15 µg/l.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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TECHNICAL FIELD

[The technical field to which invention belongs] this invention relates to the water with which the minerals of a specific rate are contained. moreover, this invention is proper quantity **** about nutritive salts, including abundantly the minerals which used seawater as the raw material -- it is related with water Moreover, it is easy to drink this invention, and it relates to the raw material water for [various] processed foods the raw material water of a drink and various drainage system drinks and soy sauce effective for health promotion, bean paste, an alcoholic beverage, cooking water, tofu, pickles, for cooking, etc.

PRIOR ART

[Description of the Prior Art] In recent years, many health drinks are sold from the standpoint of health promotion and lifestyle-related illness prevention. Some things which many Kamiichi also of the drink aiming at mineral reinforcement is carried out, and used seawater as the raw material in it are also proposed. For example, the health drink which used the mineral in seawater for JP,55-150876,A, JP,9-271356,A, a JP,11-4676,A number official report, JP,11-169850,A, JP,11-32726,A, JP,10-120578,A, etc. is proposed. Moreover, deep sea water attracts attention and the drink aiming at the health promotion using this is also proposed these days. (for example, JP,10-150960,A) However, main minerals which used seawater as the raw material, such as magnesium and calcium. it is proper quantity **** about nutritive salts, such as a nitrate, a nitrite, phosphate, a sulfate, and silicate, including abundantly minute amount minerals, such as manganese, copper, zinc, chromium, and a selenium, -- the raw material water of the drink which is easy to drink and demonstrates the health promotion effect, or various drainage system drinks is not proposed

[0003] With the conventional technology, it is bitter in seawater. (bittern) Although it is common in the point of using, the relation with the component composition which the whole aspect's of each drink composition is not clear, and contributes to those health promotion effects is not clarified. Although the various health drinks manufactured from the former using the bitter in seawater are proposed on the other hand and the drink which asks deep sea water for a water raw material is proposed recently, similarly the relation of the component composition and the health promotion effect which are contained in deep sea water also in this case is not clarified.

[0004] Moreover, conventionally, the thing existed "seawater treatment" Coming [atopic dermatitis], and, partly, it was admitted from ancient times that seawater was effective. furthermore, the example which suggests that depths seawater is effective to atopic dermatitis is also already reported (example: -- open symposium "the present condition of a depths seawater deployment", marine foods and medical treatment, November 22, Heisei 8, a high new culture hall, and Kochi-shi) However, these examples are the methods of dipping the body directly all over seawater, or applying seawater to the affected part, and a report is hardly carried out about the effect at the time of drinking. Moreover, although introduction is carried out a little in the above-mentioned example, as for one effective [how] and its causal relation, which component in seawater or depths seawater is not clarified in respect of health promotion. Unlike the conventional drink, it was easy to drink and desire of the drink in which the health promotion effect is shown was carried out with clarifying composition of the component so that it might mention above.

EFFECT OF THE INVENTION

It is going to obtain the raw material water for using effective seawater for various food, such as the new drink used as the raw

material, its raw material water and soy sauce, bean paste, an alcoholic beverage, cooking water, tofu, pickles, a dish, and a processed food, from a viewpoint of the "health promotion effect." From the former, research with the already huge role in the human body of the main minerals contained all over seawater is done, and the importance is recognized enough. Especially, the health promotion effect of a minute amount mineral attracts attention, and active research and development are done recently. However, for each function in a human body, it is still difficult and it is in vivo to explain logically completely work of each component which is entangled very intricately and is contained all over seawater. Or usually the effect is synthetically judged by the experiment of in vitro. this invention uses seawater as a raw material, and tends to drink it, and is in vivo. It is going to offer the new water in which the remarkable health promotion effect is shown in an experiment. In addition, in this invention, water points out the raw material water used for various food, such as the raw material water for potable water itself and various drainage system beverage production and soy sauce, bean paste, an alcoholic beverage, cooking water, tofu, pickles, a dish, and a processed food.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] this invention is a ***** thing about solution in the above-mentioned technical problem. That is, it is easy to drink and this invention is health promotion, lifestyle-related illness prevention, other illness prevention, or healing (collect hereafter.).

MEANS

[Means for Solving the Problem] In this invention, it is characterized by the water of the range with which the component which is water obtained as a raw material and is contained there specifies seawater below.

[Water composition]

(1) Sodium; 200 or less mg/L (2) Magnesium; 30 or more mg/L (3) -- calcium ; 5 or more mg/L (4) Potassium; 5 or more mg/L (5) Sum total [of zinc, copper, iodine, Lynn, a selenium, manganese, and chromium]; 2.5 More than mug/L (6) Boron; Sulfur; which exists as a 1.5 or less mg/L (7) sulfate 10 or more mg/L The nitrogen which exists as (8) nitrates, the nitrogen which exists as a nitrite, and phosphate ***** -- the sum total of the silicon which exists as existing Lynn and silicate; More than 15microg/L [0007] Moreover, it is easy to drink this invention, and the suitable relation between various nutritive-salts contents and a chlorine content is specified as composition of a component effective in health promotion. That is, in this invention, the new water which specified the relation with the weight ratio of the sum total content of silicon and a chlorine content which exists as the nitrogen which exists as the weight ratio and nitrate of the sulfur which exists as a sulfate, and chlorine, the nitrogen which exists as a nitrite, Lynn which exists as phosphate, and silicate is offered. although minute amount quantitative analysis prescribes the numeric value of contents, such as the above-mentioned mineral, since it changes greatly with the analysis meanses, with the present analysis technology, such a microanalysis result has the need of defining tools of analysis and analysis conditions clearly, when specifying correctly the numeric value of the composition rate by the microanalysis result Therefore, the tools of analysis and analysis conditions which are adopted in order to specify the composition rate in this invention to Table 1 are shown.

[0008]

[Table 1] The tools of analysis adopted by this invention -----
----- A component An analysis means to adopt ** ** --
----- Na The ICP-AES method Mg The ICP-AES method calcium The ICP-AES method K An atomic absorption method Zn The ICP-MS method Cu The ICP-MS method I The ICP-MS method P Absorptiometry Se The ICP-MS method A hydride method Mn The ICP-MS method Cr The ICP-

MS method The BICP-AES method SO 4 The IC method NO3
absorptiometry NO2 Absorptiometry Si ICP-AES method -----

----- [0009] although the feature of the water in this invention is in the ease of drinking, and the health promotion effect -- the feature as the component composition -- ** -- the nutritive salts of the abundant specific rates of a main mineral and a minute amount mineral, and ** proper quantity, and ** -- it is in the ratio of suitable nutritive salts and a chloride In this invention, it is easy to drink and is going to clarify the composition rate which the health promotion effect contains in the new water verified clearly. however, it mentions above -- as -- various kinds -- although progress of the research is astonishing about the need for minerals, and its work, it is still difficult to explain a relation (for example, diabetes, atopic dermatitis) with many illnesses tidily

[0010] The process of the water which used seawater as the raw material which has the minerals of the above-mentioned property composition in this invention below is explained. Although the surface layer water or deep sea water of the ocean can be used for the raw material of the water of this invention, it is desirable to use deep sea water and it is suitable for it to use the seawater which took in water from depth-sounding ***** of 200m especially. Manufacture of the water of this invention begins from dividing seawater into the concentration liquid containing the sodium chloride, and water by the means of general-purpose desalting processing first. Desalting processing is performed by for example, the reverse osmosis membrane method, the electrodialysis process, the ion exchange membrane process, the distillation condensing method, etc. The obtained water can be used as raw material water of the water of the composition in this invention by which specification was carried out [above-mentioned]. That is, the mineral concentration liquid which contained the mineral of magnesium, calcium, and others abundantly mainly except for the sodium chloride by the heating condensing method etc. is obtained from the obtained concentration liquid. When using deep sea water as a raw material especially, the suitable raw material water for this

invention is obtained by blending the water-soluble mineral component obtained from this mineral concentration liquid or mineral concentration liquid with the water obtained by the above-mentioned desalting processing.

[0011] Although the temperature conditions when removing a sodium chloride from desalting processing and concentration liquid etc. are related in this invention in order to store composition for mineral content within the limits of a convention of a claim, it is mainly adjusted by the addition of the water-soluble mineral obtained from the above-mentioned mineral concentration liquid or it. Although the water-soluble mineral component to add can be obtained from an ore, a shell, a fishbone, etc., what is obtained by concentration of the above-mentioned seawater is the most desirable. Although this desirable reason is not clear, it is thought that it comes from the appropriateness of mineral balance.

[0012] Although it is easy to drink by adding the minerals of others which remained in the water which can be obtained from seawater and water useful for a human body can be obtained after mainly removing a sodium chloride from the mineral concentration liquid obtained from seawater so that it may mention above, general potable quality water can also be used instead of the water obtained from seawater. Of course, although it is also possible to obtain raw material water from a surface layer water, it needs operation of adjustment of various nutritive salts etc. in this case, and its man day increases, and it becomes complicated. Moreover, it is desirable to ask deep sea water also for the operation for securing the detergency as a drink, it uses deep sea water as raw material water, and it is easy to drink the water manufactured by the above-mentioned method as a new drink, and is in vivo. While the clear effect was seen by experiment, the effectiveness in connection with health promotion was able to be checked.

[0013] The feature of deep sea water is in the detergency as compared with a surface layer water. For example, Table 2 is reported as an analysis value which shows a detergency.

[0014]

[Table 2]

Open symposium "the present condition of a depths seawater deployment"

Data P8 November 22, Heisei 8 Place The Kochi Shimbun broadcast hall. [0015] When providing as a drink or its raw material water, it is clear that it is more more suitable for a pure state to be just going to search for most, and to use deep sea water with little number of micro organisms as a raw material, and a much more desirable reason uses deep sea water as raw material water in the drink or its raw material water of this invention. In the case of a drink or its raw material water, one important element is "the ease of drinking, i.e., the "taste",." By the drink which uses conventional general seawater as a raw material, the balance of saltiness and mineral intake was difficult and the drink which avoids saltiness and can take in enough minerals was demanded. Although one of the purposes of this invention is in offer of a drink which avoids this saltiness and can take in sufficient minerals, it is not enough as a drink just to have removed this saltiness, and the water which contains minerals abundantly has bitterness and it is never easy to drink it. For example, the drink obtained by doing in this way has bitterness, and it is never easy to drink it as a method of fully taking in minerals, although it is possible to add the bitterness (bittern) obtained from seawater by common water, for example, tap water, saltily.

[0016] Then, this invention persons inquired wholeheartedly about realization of the water which is easy to drink, including minerals abundantly. And the huge test showed that there was [existence of nutritive salts, such as a nitrate, a nitrite, phosphate, silicate, and a sulfate] a close relation to "relief of bitterness", i.e., the "ease of drinking." this invention since involvement is more specifically in the ratio of the content of these salts, and a chlorine content -- bitterness -- stopping -- the ease of drinking, and peculiar "-- it succeeded in finding out having " deeply the water specified by

this invention -- drinking -- easy -- and peculiar "-- it was able to check having " deeply by the monitor examination covering several times Therefore, although it can also drink as potable water as it is, after the water obtained in this invention adds and etc.- processes a sweetener, fruit juice, etc. into this as raw material water, also let it be a drink. Moreover, the water of this invention can be used for various things. for example, the thing to use for **, such as seasonings, such as soy sauce and bean paste, an alcoholic beverage, cooking water, tofu, pickles, a dish, and a processed food, -- peculiar "-- while " comes out deeply, the health promotion effect is also expectable

[0017] the time of using the water specified by this invention as a drink or raw material water of various food grades -- "the ease of drinking", and "-- peculiar -- deep -- " and the so-called **

[Brief Description of the Drawings]

[Drawing 1] Change of the blood sugar level before and behind drink ingestion of this invention, HbA1C, the amount of total cholesterols, and the amount of neutral fats

[Drawing 2] the blood sugar level before and behind drink ingestion of this invention, HbA1C, and the amount of total cholesterols -- and -- and LDL-C (bad cholesterol) Change

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the water with which the minerals of a specific rate are contained. moreover, this invention is optimum dose **** about nutritive salts, including abundantly the minerals which used seawater as the raw material -- it is related with water Moreover, it is easy to drink this invention, and it relates to the raw material

water for [various] processed foods the raw material water of a drink and various drainage system drinks and soy sauce effective for health promotion, bean paste, an alcoholic beverage, cooking water, tofu, pickles, for cooking, etc.

[0002]

[Description of the Prior Art] In recent years, many health drinks are sold from the standpoint of health promotion and lifestyle-related illness prevention. Some things which many Kamiichi also of the drink aiming at mineral reinforcement is carried out, and used seawater as the raw material in it are also proposed. For example, the health drink which used the mineral in seawater for JP,55-150876,A, JP,9-271356,A, a JP,11-4676,A number official report, JP,11-169850,A, JP,11-32726,A, JP,10-120578,A, etc. is proposed. moreover, deep sea water attracts attention and the drink aiming at the health promotion using this is also proposed these days (for example, JP,10-150960,A) With however, main minerals which used seawater as the raw material, such as magnesium and calcium it is optimum dose **** about nutritive salts, such as a nitrate, a nitrite, phosphate, a sulfate, and silicate, including abundantly minute amount minerals, such as manganese, copper, zinc, chromium, and a selenium, -- the raw material water of the drink which is easy to drink and demonstrates the health promotion effect, or various drainage system drinks is not proposed

[0003] With the conventional technology, it is bittern in seawater. (bittern) Although it is common in the point of using, the relation with the component composition which the whole aspect's of each drink composition is not clear, and contributes to those health promotion effects is not clarified. Although the various health drinks manufactured from the former using the bittern in seawater are proposed on the other hand and the drink which asks deep sea water for a water raw material is proposed recently, similarly the relation of the component composition and the health promotion effect which are contained in deep sea water also in this case is not clarified.

[0004] Moreover, conventionally, the thing existed "seawater treatment" Coming [atopic dermatitis], and, partly, it was admitted from ancient times that seawater was effective. furthermore, the example which suggests that depths seawater is effective to atopic dermatitis is also already reported (example: -- open symposium "the present condition of a depths seawater deployment", marine foods and medicine, November 22, Heisei 8, a high new culture hall, and Kochi-shi) However, these examples are the methods of dipping the body directly all over seawater, or applying seawater to the affected part, and a report is hardly carried out about the effect at the time of drinking. Moreover, although introduction is carried out a little in the above-mentioned example, as for one effective [how] and its causal relation, which component in seawater or depths seawater is not clarified in respect of health promotion. Unlike the conventional drink, it is easy to drink, and healthy so that it may mention above

[0005]

[Problem(s) to be Solved by the Invention] this invention is a ***** thing about solution in the above-mentioned technical problem. That is, it is easy to drink and this invention is health promotion, lifestyle-related illness prevention, other illness prevention, or healing (collecting hereafter " health). From the former, research with the already huge role in the human body of the main minerals contained all over seawater is done, and the importance is recognized enough. Especially, a minute amount mineral is healthy recently. However, for each function in a human body, it is still difficult and it is in vivo to explain logically completely work of each component which is entangled very intricately and is contained all over seawater. Or usually the effect is synthetically judged by the experiment of in vitro. this invention uses seawater as a raw material, and tends to drink it, and is in vivo. It sets to an experiment and is remarkable health. In addition, in this invention, water points out the raw material water used for various food, such as the raw material water for potable water itself and various drainage system beverage production and soy sauce,

bean paste, an alcoholic beverage, cooking water, tofu, pickles, a dish, and a processed food.

[0006]

[Means for Solving the Problem] In this invention, it is characterized by the water of the range with which the component which is water obtained as a raw material and is contained there specifies seawater below.

[Water composition]

(1) Sodium; 200 or less mg/L (2) Magnesium; 30 or more mg/L (3) -- calcium ; 5 or more mg/L (4) Potassium; 5 or more mg/L (5) Sum total [of zinc, copper, iodine, Lynn, a selenium, manganese, and chromium]; 2.5 More than mug/L (6) Boron; Sulfur; which exists as a 1.5 or less mg/L (7) sulfate 10 or more mg/L the nitrogen which exists as a (8) nitrate, the nitrogen which exists as a nitrite, and phosphate ***** -- the sum total of the silicon which exists as existing Lynn and silicate; more than 15microg/L --

[0007] Moreover, it is easy to drink this invention, and the suitable relation between various nutritive-salts contents and a chlorine content is specified as composition of a component effective in health promotion. That is, in this invention, the new water which specified the relation with the weight ratio of the sum total content of silicon and a chlorine content which exists as the nitrogen which exists as the weight ratio and nitrate of the sulfur which exists as a sulfate, and chlorine, the nitrogen which exists as a nitrite, Lynn which exists as phosphate, and silicate is offered. although microestimation analysis prescribes the numeric value of contents, such as the above-mentioned mineral, since it changes greatly with the analysis meanses, with the present analysis technology, such a microanalysis result has the need of defining tools of analysis and analysis conditions clearly, when specifying correctly the numeric value of the composition rate by the microanalysis result

Therefore, the tools of analysis and analysis conditions which are adopted in order to specify the composition rate in this invention to Table 1 are shown.

[0008]

[Table 1] The tools of analysis adopted by this invention -----

----- A component An analysis means to adopt ** ** --

----- Na The ICP-AES method Mg The ICP-AES method calcium The ICP-AES method K An atomic absorption method Zn The ICP-MS method Cu The ICP-MS method I The ICP-MS method P Absorptiometry Se The ICP-MS method A hydride method Mn The ICP-MS method Cr The ICP-MS method The BICP-AES method SO 4 The IC method NO3 absorptiometry NO2 Absorptiometry Si ICP-AES method -----

----- [0009] although the feature of the water in this invention is in the ease of drinking, and the health promotion effect -- the feature as the component composition -- ** -- the nutritive salts of the abundant specific rates of a main mineral and a minute amount mineral, and ** proper quantity, and ** -- it is in the ratio of suitable nutritive salts and a chloride In this invention, it is easy to drink and is going to clarify the composition rate which the health promotion effect contains in the new water verified clearly. however, it mentions above -- as -- various kinds -- although progress of the research is astonishing about the need for minerals, and its work, it is still difficult to explain a relation (for example, diabetes, atopic dermatitis) with many illnesses tidily

[0010] The process of the water which used seawater as the raw material which has the minerals of the above-mentioned property composition in this invention below is explained. Although the surface layer water or deep sea water of the ocean can be used for the raw material of the water of this invention, it is desirable to use deep sea water and it is suitable for it to use the seawater which took in water from depth-sounding **** of 200m especially. Manufacture of the water of this invention begins from dividing seawater into the concentration liquid containing the sodium chloride, and water by the means of general-purpose desalting processing first. Desalting processing is performed by for example, the reverse osmosis membrane method, the electrodialysis process, the ion exchange membrane process, the distillation condensing method, etc. The obtained water can be used as raw material water

of the water of the composition in this invention by which specification was carried out [above-mentioned]. That is, the mineral concentration liquid which contained the mineral of magnesium, calcium, and others abundantly mainly except for the sodium chloride by the heating condensing method etc. is obtained from the obtained concentration liquid. When using deep sea water as a raw material especially, the suitable raw material water for this invention is obtained by blending the water-soluble mineral component obtained from this mineral concentration liquid or mineral concentration liquid with the water obtained by the above-mentioned desalting processing.

[0011] Although the temperature conditions when removing a sodium chloride from desalting processing and concentration liquid etc. are related in this invention in order to store composition for mineral content within the limits of a convention of a claim, it is mainly adjusted by the addition of the water-soluble mineral obtained from the above-mentioned mineral concentration liquid or it. Although the water-soluble mineral component to add can be obtained from an ore, a shell, a fishbone, etc., what is obtained by concentration of the above-mentioned seawater is the most desirable. Although this desirable reason is not clear, it is thought that it comes from the appropriateness of mineral balance.

[0012] Although it is easy to drink by adding the minerals of others which remained in the water which can be obtained from seawater and water useful for a human body can be obtained after mainly removing a sodium chloride from the mineral concentration liquid obtained from seawater so that it may mention above, general potable quality water can also be used instead of the water obtained from seawater. Of course, although it is also possible to obtain raw material water from a surface layer water, it needs operation of adjustment of various nutritive salts etc. in this case, and its man day increases, and it becomes complicated. Moreover, it is desirable to ask deep sea water also for the operation for securing the detergency as a drink, it uses deep sea water as raw material water, and it is easy to drink the water manufactured by

the above-mentioned method as a new drink, and is in vivo. While the clear effect was seen by experiment, the effectiveness in connection with health promotion was able to be checked.

[0013] The feature of deep sea water is in the detergency as compared with a surface layer water. For example, Table 2 is reported as an analysis value which shows a detergency.

[0014]

[Table 2]

Open symposium "the present condition of a depths seawater deployment"

Data P8 November 22, Heisei 8 Place The Kochi Shimbun

broadcast hall [0015] When providing as a drink or its raw material water, it is clear that it is more more suitable for a pure state to be just going to search for most, and to use deep sea water with little number of micro organisms as a raw material, and a much more desirable reason uses deep sea water as raw material water in the drink or its raw material water of this invention. In the case of a drink or its raw material water, one important element is "the ease of drinking, i.e., the "taste",." By the drink which uses conventional general seawater as a raw material, the balance of saltiness and mineral intake was difficult and the drink which avoids saltiness and can take in enough minerals was demanded. Although one of the purposes of this invention is in offer of a drink which avoids this saltiness and can take in sufficient minerals, it is not enough as a drink just to have removed this saltiness, and the water which contains minerals abundantly has bitterness and it is never easy to drink it. For example, the drink obtained by doing in this way has bitterness, and it is never easy to drink it as a method of fully taking in minerals, although it is possible to add the bitterness (bittern) obtained from seawater by common water, for example, tap water, saltily.

[0016] Then, this invention persons inquired wholeheartedly about realization of the water which is easy to drink, including minerals abundantly. And the huge test showed that there was [existence of nutritive salts, such as a nitrate, a nitrite, phosphate, silicate, and a

sulfate] a close relation to "relief of bitterness", i.e., the "ease of drinking." this invention since involvement is more specifically in the ratio of the content of these salts, and a chlorine content -- bitterness -- stopping -- the ease of drinking, and peculiar "-- it succeeded in finding out having " deeply the water specified by this invention -- drinking -- easy -- and peculiar "-- it was able to check having " deeply by the monitor examination covering several times Therefore, although it can also drink as potable water as it is, after the water obtained in this invention adds and etc.- processes a sweetener, fruit juice, etc. into this as raw material water, also let it be a drink. Moreover, the water of this invention can be used for various things. for example, the thing to use for **, such as seasonings, such as soy sauce and bean paste, an alcoholic beverage, cooking water, tofu, pickles, a dish, and a processed food, -- peculiar "-- while " comes out deeply, the health promotion effect is also expectable

[0017] the time of using the water specified by this invention as a drink or raw material water of various food grades -- "the ease of drinking", and "-- although [peculiar] ", and "the so-called effect of the taste" and so-called "taste of water" are filled enough deeply, the health promotion effect as other important effects can also fully be demonstrated It understands also from it being known from ancient times that the marine algae by which the importance for the human body of the minerals in seawater is enough recognized, for example, the minerals in seawater are abundantly accumulated from ancient times are good for the body. The role in the human body of main minerals and the history of the research on importance are scientifically old, and many things are solved. Moreover, the research on a minute amount mineral has also become clear [many things] conjointly with a line crack and progress of analysis technology actively these days. With this, the importance of a minute amount mineral is also recognized and the maximum intake level is set to 12 kinds of minerals, such as zinc, copper, manganese, and a selenium, by Japanese recommended dietary allowance (the 6th revision). About boron, although

relation with the present environmental hormones is regarded as questionable, it is hard to say that the relation with many illnesses is sufficiently clear. it is made to spread and specifies as one factor of this invention which sets the health promotion effect to one of the purposes

[0018] Thus, although the role of the various minerals in the human inside of the body and the research on a function are progressing, the operation in a human body is still more complicated. For example, also about the function of a mineral, the interaction with an enzyme, hormone, a vitamin, other minerals, etc. is very complicated, and, in addition, it is difficult to explain the effect of mineral ingestion theoretical sufficiently tidily. For this reason, it is the actual condition which must be judged from the result of an animal experiment or a human body experiment even now. The following examples explain the health promotion effect of the water of this invention.

[0019]

[Example 1] Taste examination deep sea water was used as the raw material, and the taste examination of the drink manufactured by the manufacture method indicated in the text was carried out. An examination is a healthy people monitor without the direct relation to our company. I had ten persons drink and compare this drink with a comparison drink, and had "the ease of drinking", and "bitterness" compared. Here, a comparison drink is what added the bittern for tofu manufacture (bittern) to tap water, and the addition of the bittern applied the amount of magnesium so that it might become the amount of said to this drink mostly. These both composition was shown in Table 3.

[0020]

[Table 3]

	A component	This drink	comparison drink
Sodium (ppm)	65.2	80.6	
Magnesium (ppm)	158.4	156.5	
Calcium (ppm)	60.1	71.1	
potassium (ppm)	59.8	56.4	**
Lead (ppb)	1.5	1.3	
Copper (ppb)	0.4		
Iodine (ppb)	10.39.6	Lynn	(ppb) 10.1 7.8
Selenium (ppb)	0.008		

0.006 Manganese (ppb) 0.3 0.2 chromium (ppb) <0.2 < 0.2 Salt
 Base 523.1 (ppm) 621.3 Boron (ppm) 0.1 1.2 nitrates and a nitrite
 0.13 (as N atom) (ppm) 0.02 Phosphate (as P atom) (ppm) 15.6
 0.11 Silicate (as Si atom) (ppm) 0.11 < 0.01 sulfate (as S atom)
 (ppm) 150 11 ----- [0021] The result of a
 taste examination is shown in Table 4.

[0022]

[Table 4]

result of a test of taste ----- In the ease of
 drinking pain Taste Monitor ----- a>b a=b a<b
 a>b a=b a<b ----- A O O B O O C O O D O
 O E O O F O O G O O H O O J O O K O O -----

---- a: This invention drink b: Comparison drink [0023]

[Taste evaluation] About the ease of drinking, eight persons
 answered that it was easy to drink the direction of this drink, and
 answered that two persons were equivalent among ten healthy
 person monitors, and all ten persons answered about bitterness that
 there was less bitterness than a comparison drink as shown in
 Table 4. Although it is not clear where the difference in this taste
 comes from, as long as it judges from composition of Table 3, it
 accepts as a thing with the amount and relevance of nutritive salts.
 Thus, as compared with the comparison drink which only added
 bitter to tap water, it is easy to drink to ** the drink which added
 the mineral concentrate except NaCl obtained from deep sea water
 as well as the water which used deep sea water as the raw material,
 and it has little bitterness.

[0024]

[Example 2] diabetic under going to hospital regularly (39 years
 old, boy) The drink manufactured by the manufacture method
 indicated in the text was given one-day 1L every by having used
 deep sea water as the raw material, and the blood sugar level in the
 ingestion start order etc. was pursued. Component composition of
 the drink used in the example is shown in Table 5.

[0025]

[Table 5]

component composition of this potable water used for the example 2 and the example 3 ----- A component content ----- Sodium (ppm) 67.6 Magnesium (ppm) 191.5 Calcium (ppm) 65.2 A potassium (ppm) 57.7 ** Lead (ppb) 1.4 Copper (ppb) 0.4 Iodine (ppb) 9.7 Lynn (ppb) 10.3 selenium (ppb) 0.009 manganese (ppb) 0.3 chromium (ppb) <0.2 salt Base (ppm) 499.0 Boron (ppm) 0.2 A nitrate and nitrite [As N atom] (ppm) 0.16 Phosphate [as P atom] (ppm) 14.1 Silicate [as Si atom] (ppm) 0.15 162 [as S atom] (ppm) ----- -- [0026] [sulfate]

[Evaluation of a result] Change of the blood sugar level before and behind the ingestion start of the drink of this example, HbA1C, the amount of total cholesterols, and the amount of neutral fats is shown in drawing 1 . In the patient of this experiment, as shown in drawing 1 , the blood sugar level, HbA1C, and the amount of total cholesterols were increasing clearly to ingestion of the drink of this example, and any value was a quite high value compared with the healthy person. However, after this drink ingestion, these values fell notably, reached normal values mostly, and are mostly stable for three months after that. Although a neutral fat is generally sharply changed according to the content of the meal taken in etc. and it is hard to accept a not much clear inclination, by this test, a downward tendency is accepted once.

[0027]

[Example 3] Although this example is also a diabetic example, it is a diabetic under going to hospital regularly (61 years old, boy). It is 700 cc per day about the water drink of the composition ratio of this invention shown in Table 5 by using deep sea water as a raw material. It gave every and the blood sugar level in the ingestion start order etc. was pursued.

[0028]

[Evaluation of a result] the blood sugar level before and behind the ingestion start of this drink, Hb1AC, and the total cholesterol -- and -- Change of the amount of LDL-C (bad cholesterol) is shown in drawing 2 . They are after this drink ingestion start the blood

sugar level and Hb1AC so that drawing 2 may show. It falls clearly, it takes to this and they are the total cholesterol and LDL-C (bad cholesterol). It is in the inclination of a fall, especially is LDL-C. The fall inclination is clear. And this inclination is continued for about 11 months.

[0029] Many numeric values in connection with the diabetes from the above-mentioned example 2 and an example 3, i.e., the blood sugar level, Hb1AC, the total cholesterol, and LDL-C (bad cholesterol) The inclination improved by ingestion of this drink can be checked enough.

[0030] By present, many research results are released about the relation between diabetes and a mineral (9 15 for example, K H.Thompson D.V.Godin, Nutretion Res. NO. 1377 (1995)). Although not recognized as now a clear relation existing in these both, the close relation between these both is suggested by the research result of these many.

[0031] Therefore, surmising that there are the mineral and relation which are abundantly included in this drink has the natural result shown in the above-mentioned examples 2 and 3. The detergency of the nutritive salts that to this drink contained and this drink and a further are H₂O. It is not clear what relation to the effect of examples 2 and 3 the very thing has at present. [many] Although it was difficult to show the reason clearly in short, the effect that the drink of this invention manufactured by using deep sea water as a raw material which has the composition ratio shown in Table 5 improved many numeric values in connection with diabetes has verified clearly.

[0032]

[Example 4] The influence affect the blood flow of the human body of potable water manufactured by the manufacture method indicated in the text was verified by measuring blood-flow pass time using MC-FAN (product made from Micro channel Flow Analyer; SANTSURI machine ** Co.). Composition of the component used for this example is the same as what was used in the examples 2 and 3. although the mean time of the blood-flow

passage in healthy people is made into 40 - 60 seconds / whole-blood 100 micrometers (a HEMOREOlogy study group magazine --) Only in the person for 60 seconds or more, in the 1st volume, 1998, PP 53-55, and this example, the blood-flow pass time before drink selects five persons by the preliminary test, and they are this drink and *****. 400ml was made to drink, a ballot was taken 1 hour after, and blood-flow pass time was measured. Moreover, in a subject, it is one day about this drink. It took in for one month, and got 500ml at a time, and the blood flow was measured by the same equipment and same method as a top one month after. The measurement result was shown in Table 6.

[0033]

[Table 6]

Influence -----	exerted on the blood-flow									
pass time of this drink	Subject Pass time (a second / 100 mum)									
-----	Before a drink					1 hour after drink				
month after drink -----	This potable water									
49.1 ** 2.8	41.2 ** 2.2	43.2 ** 2.5	A -----							
Distilled water	49.1 ** 2.8	48.7 ** 2.6	51.3 ** 2.6	-----						
-----	book potable water	55.1 ** 2.9	47.4 ** 2.3	46.5 ** 2.8	-----					
B -----	Distilled water	55.1 ** 2.9	51.8 ** 2.2	-----						
52.1 ** 2.7	----- This potable water									
2.9 50.3 ** 2.6	48.5 ** 2.3	C -----								
water	61.9**2.9	62.3 ** 3.0	61.7 ** 2.6	-----						
This potable water	60.4 ** 2.6	52.1 ** 2.4	51.8 ** 2.3	D -----						
-----	Distilled water	60.4 ** 2.6	61.1 ** 2.9	60.0 ** 2.4	-----					
-----	This potable water	62.3 ** 2.4	51.8 ** 2.7	-----						
50.6**2.5	E -----									
62.7 ** 2.5	63.2** 2.6	-----								
[0034]										

[0034]

[Evaluation of a result] According to the above-mentioned table 6, also statistically, it is judged with "those with a significant difference" ($P < 0.05$), and the clear effect of potable water of this invention over a blood flow is shown. A poor blood flow is concerned with the origin of the health of a human body, and especially the close relation with the microcirculatory system of a

human body is pointed out. Therefore, it is thought to symptoms considered that the water of this invention happens according to the defect of a microcirculatory system, such as the "stiffness of the shoulders", "asthenopia", "cold nature", and "high blood pressure", that it is effective.

[0035]

[Example 5] This example considered the influence affect the atopic dermatitis by drink of potable water manufactured by the manufacture method indicated in the text. Composition of the component of potable water used for this example is as having been shown in Table 7.

[0036]

[Table 7]

----- A component content -----
 ----- sodium (ppm) 70.9 magnesium (ppm) 193.7 Calcium (ppm) 61.1 potassium (ppm) 58.8 ** Lead (ppb) 1.4 Copper (ppb) 0.3 iodine (ppb) 10.0 Lynn (ppb) 9.6 Selenium (ppb) 0.008 manganese (ppb) 0.3 Chromium (ppb) <0.2 salt Base (ppm) 512.4 Boron (ppm) 0.2 A nitrate and a nitrite (as N atom) (ppm) 0.17 Phosphate (as P atom) (ppm) 15.0 silicate (as Si atom) (ppm) 0.16 Sulfate (as S atom) (ppm) 166 ----- [0037] I set five

examples of eczema and dermatitis as the examination target in this experiment, and it had the subject do continuation drink of this potable water for 1500m two months per day. the judgment of an effect was performed after two weeks, four weeks, six weeks, and eight weeks, itching, an erythema, cornification, a dander, the rhagades, and the comprehensive view were observed, and effectiveness was judged in four stages (+++: -- very -- validity, ++: validity, +: minor response, and -: -- it is not thought that it is effective) A result is shown in Table 8.

[0038]

[Table 8]

The influence affect the atopic dermatitis of this potable water -----

----- Subject Subject Subject Subject Subject Progress
 A B C D E ----- After two weeks - + + + + + + +

----- After four weeks + + + + + + + -----
----- After six weeks + + + + + + After [of + + + -----
-----] eight weeks - - + + + + ----- [0039]

[Evaluation of a result] The effectiveness from Table 8 to the atopic dermatitis by this potable water drink is clear. The water drink containing the mineral of the specific composition in this invention will show the clear recovery effect to atopic dermatitis by drink of a constant rate for one day.

[0040]

[Effect of the Invention] potable water shown in the examples 1-5 of this invention -- 1 Many numeric values (for example, cholesterol) when [healthy] it relates to that it is easy to drink as compared with other mineral supply drinks obtained from seawater, two diabetes, and it improving clearly and 3 -- it is clear that an effect is looked at by to improve the blood flow it is considered that is the origin of many illnesses, and 4 drink at atopic dermatitis

[Translation done.]

CLAIMS

[Claim(s)]

[Claim 1] Water which uses seawater as a raw material and has an inclusion in the following range.

(1) Sodium; 200 or less mg/L (2) magnesium; 30 or more mg/L (3) calcium; 5 or more mg/L (4) potassiums; 5 or more mg/L Sum total [of (5) zinc, copper, iodine, Lynn, a selenium, manganese, and chromium];.

2.5 more than mug/L (6) boron; 1.5 or less mg/L Sulfur which exists as (7) sulfates; 10 or more mg/L The nitrogen which exists as (8) nitrates, the nitrogen which exists as a nitrite, and phosphate
***** -- sum total [of the silicon which exists as existing Lynn and silicate];

More than 15microg/L [Claim 2] Water of the claim 1 whose weight ratio to the chlorine content of the sulfur content which exists as a sulfate is 0.02 or more.

[Claim 3] The weight ratio of the sum total content of the nitrogen which exists as a sulfate, the nitrogen which exists as a nitrite, Lynn which exists as phosphate, and the silicon which exists as silicate, and a chlorine content Water of the claims 1 and 2 which are 1.5×10 to five or more.

[Claim 4] Water of the claims 1-3 whose seawater is deep sea water.

[Claim 5] Deep sea water is depth of water. 200m Water of the claim 4 characterized by taking in water from the part of ****.

[Claim 6] Water according to claim 1 to 5 characterized by using it as raw material water of a drink or various drainage system drinks.

[Claim 7] Water according to claim 1 to 5 characterized by using as raw material water for [various] processed foods soy sauce, bean paste, an alcoholic beverage, cooking water, tofu, pickles, for cooking, etc.

8週間後 - - + + ++

【0039】

【結果の評価】表8から、本飲料水飲用によるアトピー性皮膚炎への有効性は明らかである。本発明における特定組成のミネラルを含む水飲料が、1日一定量の飲用によって、アトピー性皮膚炎に対して明らかな治癒効果を示す。

【0040】

【発明の効果】本発明の実施例1～5に示す飲料水が、

1) 海水から得られる他のミネラル補給飲料に比較して飲み易いこと、2) 糖尿病及びそれに関連する健康上の諸*

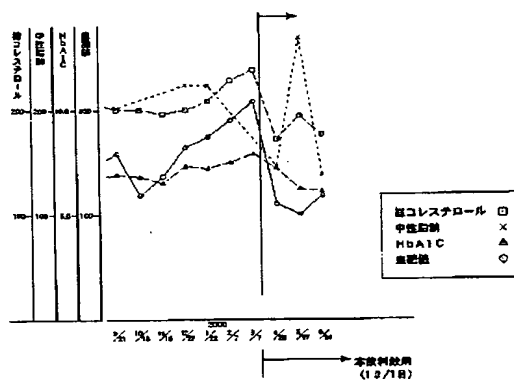
* 数値（例えばコレステロール）を明らかに改善すること、3) 多くの疾病の根源と見なされる血流を改善すること、4) 飲用によって、アトピー性皮膚炎に効果が見られることは明らかである。

【図面の簡単な説明】

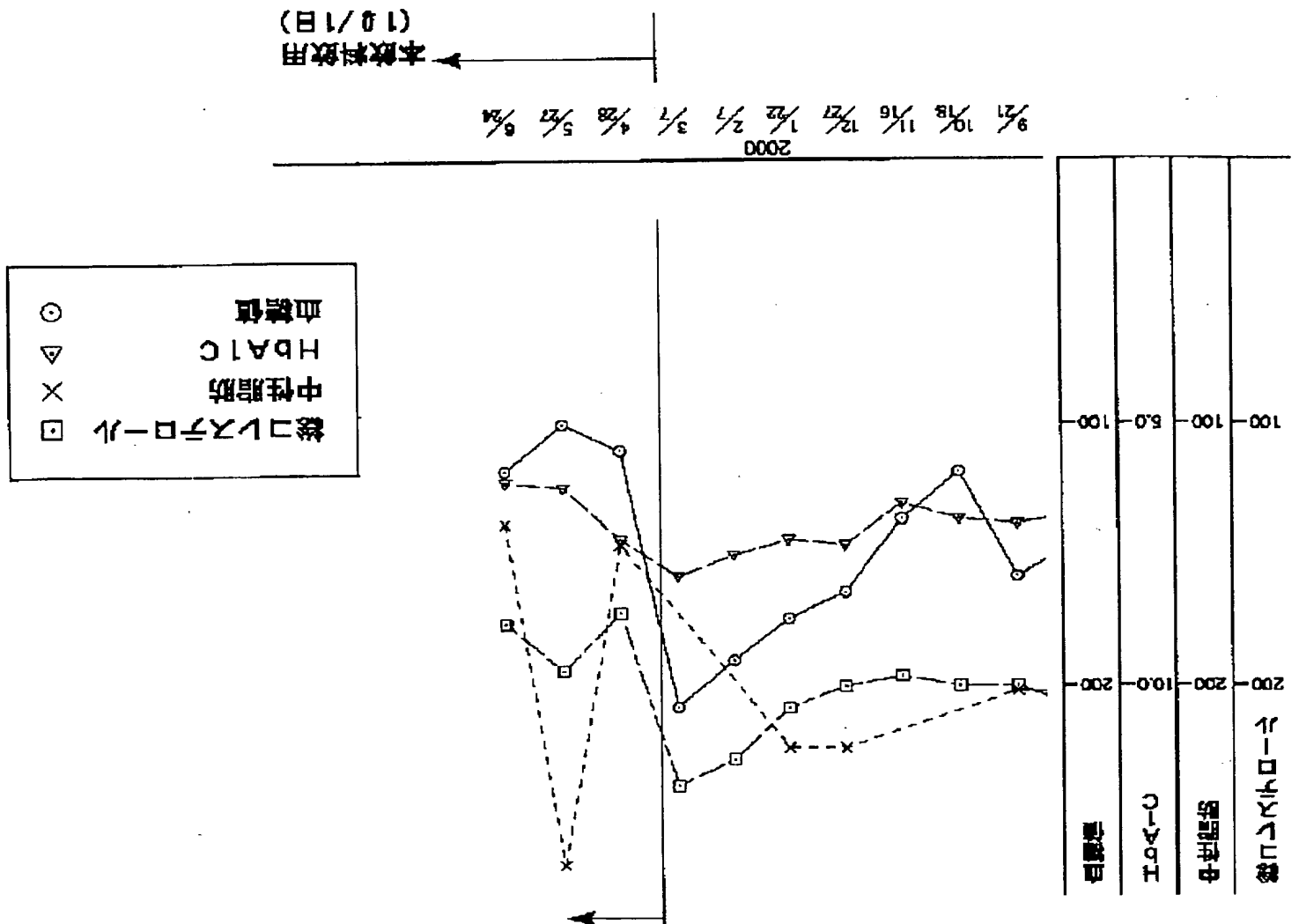
【図1】本発明の飲料摂取前後の血糖値、HbA1C、総コレステロール量及び中性脂肪量の変化

【図2】本発明の飲料摂取前後の血糖値、HbA1C、総コレステロール量及びLDL-C(悪玉コレステロール)の変化

【図1】



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(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2002-192169

(P2002-192169A)

(43) 公開日 平成14年7月10日 (2002. 7. 10)

(51) Int.Cl. ⁷	識別記号	F I	テマコード* (参考)
C 0 2 F 1/68	5 1 0	C 0 2 F 1/68	5 1 0 A 4 B 0 1 7
	5 2 0		5 2 0 K
A 2 3 L 2/00		A 2 3 L 2/00	V

審査請求 未請求 請求項の数 7 O L (全 10 頁)

(21) 出願番号 特願2000-397867 (P2000-397867)

(22) 出願日 平成12年12月27日 (2000. 12. 27)

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最終頁に続く

(54) 【発明の名称】 海水を原料とした飲料及びその原料水

(57) 【要約】

【課 題】 他のミネラル補給飲料に比較して飲み易く、糖尿病やそれに関連する健康上の諸数値（例えばコレステロール）を向上させ、多くの疾病の根源となる血流を改善し、かつ飲用によるアトピー性皮膚炎の改善等の健康増進効果を示す水の提供。

【解決手段】 1 ナトリウム：200mg/L以下、2 マグネシウム：30mg/L以上、3 カルシウム：5mg/L以上、4 カリウム：5mg/L以上、5 亜鉛、銅、ヨウ素、リン、セレン、マンガン、クロムの合計：2.5 μg/L以上、6 ホウ素：1.5mg/L以下、7 硫酸塩として存在するイオウ：10mg/L以上、8 硝酸塩として存在する窒素、亜硝酸塩として存在する窒素、リン酸塩として存在するリン及び珪酸塩として存在する珪素の合計：15μg/L以上の水。

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【特許請求の範囲】

＊ある水。

【請求項1】 海水を原料とし、含有物が下記の範囲に＊

- | | |
|---|-------------|
| (1)ナトリウム； | 200mg/L以下 |
| (2)マグネシウム； | 30mg/L以上 |
| (3)カルシウム； | 5mg/L以上 |
| (4)カリウム； | 5mg/L以上 |
| (5)亜鉛、銅、ヨウ素、リン、セレン、マンガン、クロムの合計； | 2.5 μg /L以上 |
| (6)ホウ素； | 1.5mg/L以下 |
| (7)硫酸塩として存在するイオウ； | 10mg/L以上 |
| (8)硝酸塩として存在する窒素、亜硝酸塩として存在する窒素、リン酸塩として存在するリン及び珪酸塩として存在する珪素の合計； | 15μg /L以上 |

【請求項2】 硫酸塩として存在するイオウ含有量の塩素含有量に対する重量比が0.02以上である請求項1の水。

【請求項3】 硫酸塩として存在する窒素、亜硝酸塩として存在する窒素、リン酸塩として存在するリン、及び珪酸塩として存在する珪素の合計含有量と塩素含有量との重量比が 1.5×10^{-1} 以上である請求項1及び2の水。

【請求項4】 海水が、海洋深層水である請求項1～3の水。

【請求項5】 海洋深層水が、水深 200m 以深の個所から取水することを特徴とする請求項4の水。

【請求項6】 飲料又は各種水系飲料の原料水として使用することを特徴とする請求項1～5のいずれかに記載の水。

【請求項7】 醤油、みそ、アルコール飲料、料理水、豆腐、漬物、料理用などの各種加工食品用の原料水として用いることを特徴とする請求項1～5のいずれかに記載の水。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、特定割合のミネラルが含まれる水に関する。また、本発明は、海水を原料としたミネラル分を豊富に含み、かつ栄養塩類を適量含んだ水に関する。また、本発明は、飲み易く、かつ健康増進に効果的な飲料及び各種水系飲料の原料水並びに醤油、みそ、アルコール飲料、料理水、豆腐、漬物、料理用などの各種加工食品用の原料水に関する。

【0002】

【従来の技術】近年、健康増進、生活習慣病予防の見地から多くの健康飲料が販売されている。その中で、ミネラル補強を目的とした飲料も多く上市されており、海水を原料としたものもいくつか提案されている。例えば、特開昭55-150876号公報、特開平9-271356号公報、特開平11-4676号公報、特開平11-169850号公報、特開平11-32726号公報、特開平10-120578号公報などに海水中のミネラルを利用した健康飲料が提案されている。また、昨今、海洋深層水が注目され、これを利用した健

康増進を目的とした飲料も提案されている（例えば特開平10-150960号公報）、しかし海水を原料としたマグネシウム、カルシウム等の主要ミネラルとともに、マンガン、銅、亜鉛、クロム、セレン等の微量ミネラルを豊富に含み、硝酸塩、亜硝酸塩、リン酸塩、硫酸塩、けい酸塩等の栄養塩類を適量含んだ、飲み易く、かつ健康増進効果を発揮する飲料又は各種水系飲料の原料水は提案されていない。

【0003】従来技術では、海水中の苦汁（にがり）を利用するという点においては共通しているが、それぞれの飲料組成の全貌は明らかでなく、それらの健康増進効果に寄与する成分組成との関係は明らかにされていない。一方、従来から海水中の苦汁を利用して製造される種々の健康飲料が提案されており、最近では、水原料を海洋深層水に求める飲料などが提案されているが、同様に、この場合にも、海洋深層水に含有される成分組成と健康増進効果との関係は明らかにされていない。

【0004】また、従来、アトピー性皮膚炎に対しては「海水療法」なるものが存在し、海水が有効であることは昔から一部では認められていた。さらに、アトピー性皮膚炎に対し深層海水が有効であることを示唆する事例もすでに報告されている（例：公開シンポジウム「深層海水有効利用の現状」、水産・食品・医療、平成8年11月22日、高新文化ホール、高知市）。しかし、これらの事例は、海水中に直接的に身体を浸すとか、患部に海水を塗布するなどの方法であり、飲用した場合の効果についてはほとんど報告はされていない。また、上記の事例では若干紹介はされているが、海水中又は深層海水中のどの成分が健康増進面でどのように有効なのか、その因果関係は明らかにされていない。上述するように、従来の飲料とは異なり、飲み易く、健康増進効果を示す飲料が、その含有成分の組成を明らかにすることとともに希求されていた。

【0005】

【発明が解決しようとする課題】本発明は上記課題を解決を目ざすものである。すなわち、本発明は、飲み易く、かつ健康増進、生活習慣病予防、その他の疾病予防

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又は治癒(以下、まとめて「健康増進効果」という)の観点から、有効な、海水を原料とした新規な飲料及びその原料水並びに醤油、みそ、アルコール飲料、料理水、豆腐、漬物、料理、加工食品などの各種食品に使用するための原料水を得ようとするものである。従来から、海水中に含まれる主要ミネラルの人体での役割は、既に膨大な研究が行われ、その重要性が十分認識されている。特に、最近、微量ミネラルの健康増進効果が注目され、活発な研究開発が行われている。しかし、人体における各機能は、極めて複雑に絡み合っており、海水中に含まれる各成分の働きを論理的に完全に説明することは未だ困難であり、in vivo 又はin vitroの実験によって総合*

*的にその効果が判断されるのが普通である。本発明は、海水を原料として、飲み易く、かつin vivoの実験において顕著な健康増進効果を示す、新規な水を提供しようとするものである。なお、本発明では、水とは、飲料水自体、各種水系飲料製造のための原料水及び醤油、みそ、アルコール飲料、料理水、豆腐、漬物、料理、加工食品などの各種食品に使用する原料水を指す。

【0006】

【課題を解決するための手段】本発明では、海水を原料として得られた水であり、そこに含まれる含有成分が下記に規定する範囲の水を特徴とするものである。

【水組成】

- (1)ナトリウム; 200mg/L以下
- (2)マグネシウム; 30mg/L以上
- (3)カルシウム; 5mg/L以上
- (4)カリウム; 5mg/L以上
- (5)亜鉛、銅、ヨウ素、リン、セレン、マンガン、クロムの合計; 2.5 μg/L以上
- (6)ホウ素; 1.5mg/L以下
- (7)硫酸塩として存在するイオウ; 10mg/L以上
- (8)硝酸塩として存在する窒素、亜硝酸塩として存在する窒素、リン酸塩として存在するリン及び珪酸塩として存在する珪素の合計; 15μg/L以上

【0007】また、本発明は、飲み易く、かつ健康増進に有効な含有成分の組成として、各種栄養塩類含有量と塩素含有量の適当な関係を規定するものである。すなわち、本発明では硫酸塩として存在するイオウと塩素の重量比及び硝酸塩として存在する窒素、亜硝酸塩として存在する窒素、リン酸塩として存在するリン及び珪酸塩として存在する珪素の合計含有量と塩素含有量の重量比との関係を規定した新規な水を提供するものである。上記のミネラル等の含有量の数値は、微量定量分析によって※

※規定したものであるが、現状の分析技術では、このような微量分析結果は、その分析手段によって大きく異なるので、微量分析結果による組成割合の数値を正確に規定する場合には、分析手法及び分析条件を明確に定義しておく必要がある。したがって、表1に本発明における組成割合を規定するために採用する分析手法及び分析条件を示す。

【0008】

【表1】 本発明で採用する分析手法

含有成分	採用する分析手段	備考
Na	ICP-AES法	
Mg	ICP-AES法	
Ca	ICP-AES法	
K	原子吸光法	
Zn	ICP-MS法	
Cu	ICP-MS法	
I	ICP-MS法	
P	吸光光度法	
Se	ICP-MS法	水素化物法
Mn	ICP-MS法	
Cr	ICP-MS法	
B	ICP-AES法	
SO ₄	IC法	
NO ₃	吸光光度法	
NO ₂	吸光光度法	

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Si ICP-AES法

【0009】本発明における水の特徴は、飲み易さと健康増進効果にあるが、その含有成分組成としての特徴は、①豊富な主要ミネラル及び微量ミネラルの特定割合、②適量の栄養塩類及び③適切な栄養塩類と塩化物の比、にある。本発明では、飲み易く、健康増進効果が明らかに検証される新規な水において含有される組成割合を明確にしようとするものである。しかしながら、上述するように、各種ミネラル分の必要性及びその働きについては、その研究の進歩には目をみはるものがあるが、諸疾病との関係（例えば糖尿病、アトピー性皮膚炎）を整然と説明することは未だ困難である。

【0010】以下に本発明において上記特性組成のミネラル分を有する、海水を原料とした水の製法について説明する。本発明の水の原料は、海洋の表層水又は深層水を使用することができるが、深層水を用いるのが好ましく、特に、水深200m以深から取水された海水を使用するのが好適である。本発明の水の製造は、まず、汎用の脱塩処理の手段により、海水を塩化ナトリウムを含んだ濃縮液と水とに分けることから始まる。脱塩処理は、例えば逆浸透膜法、電気透析法、イオン交換膜法、蒸留濃縮法などにより行う。得られた水は、本発明における上記特定された組成の水の原料水として使用することができる。すなわち、得られた濃縮液から加熱濃縮法などにより、主として塩化ナトリウムを除き、マグネシウム、カルシウムその他のミネラルを豊富に含んだミネラル濃縮液が得られる。特に、海洋深層水を原料とする場合には、上記脱塩処理により得られる水にこのミネラル濃縮液又はミネラル濃縮液から得られる水溶性のミネラル成分を配合することにより、本発明に適当な原料水が得られる。

【0011】本発明では、ミネラル含有分の組成を特許請求の範囲の規定の範囲内におさめるためには、脱塩処理及び濃縮液から塩化ナトリウムを除去するときの温度条件などが関係するが、上記ミネラル濃縮液又はそれから得られる水溶性ミネラルの添加量によって主に調整される。添加する水溶性ミネラル成分は、鉱石、貝殻、魚骨等からも得ることができるが、上記海水の濃縮によって得られるものが最も好ましい。この好ましい理由は、明確ではないが、ミネラルバランスの適切さから来るものと考えられる。

【0012】上述するように海水から得られるミネラル濃縮液から主として塩化ナトリウムを除去した後、残ったその他のミネラル分を海水から得られる水に添加することにより、飲み易く、かつ人体にとって有益な水を得ることができるが、海水から得られる水の代りに一般の飲用水を用いることもできる。原料水を表層水から得ることも、勿論、可能であるが、この場合には各種栄養塩類の調整等の操作を必要とし、工数が増え煩雑となる。

また、飲料としての清浄性を確保するための操作も深層水に求めるのが好ましく、深層水を原料水とし、上記の方法で製造された水が、新規な飲料として、飲み易く、かつin vivoの実験により明らかな効果が見られるとともに健康増進にかかわる有効性を確認することができた。

【0013】深層水の特徴は、表層水に比較してその清浄性にある。例えば、清浄性を示す分析値として表2が報告されている。

【0014】

【表2】

表層水及び深層海水の生菌数比較

生菌数 CFU/ml	表層海水	深層海水
	10 ³ ~10 ⁴	10 ²

- 20 公開シンポジウム「深層海水有効利用の現状」
資料P8平成8年11月22日 場所 高知新聞放送会館
- 【0015】飲料又はその原料水として提供する場合、清浄状態が最も求められるところであり、生菌数の少ない深層水を原料とする方がより適当であることは明らかであり、本発明の飲料又はその原料水において深層水を原料水とするのが一層好ましい理由である。飲料又はその原料水の場合、一つの重要な要素は「飲み易さ」すなわち「味」である。従来、一般的な海水を原料とする飲料では、塩辛さとミネラル摂取量の兼ね合いが難しく、塩辛さを避けて十分なミネラルを摂取できる飲料が要望されていた。本発明の目的の一つは、この塩辛さを避けて、十分なミネラル分を摂取できる飲料の提供にあるが、この塩辛さを除いただけでは、飲料として十分ではなく、ミネラル分を豊富に含む水は苦味があり、決して飲み易いものではない。例えば、塩辛くなく、ミネラル分を十分に摂取する方法としては、一般水、例えば水道水に海水から得られる苦味（にがり）を添加することが考えられるが、このようにして得られる飲料は苦味があり、決して飲みやすいものではない。
- 40 【0016】そこで、本発明者らは、ミネラル分を豊富に含み、かつ飲みやすい水の実現について鋭意研究した。そして、膨大なテストの結果、硝酸塩、亜硝酸塩、リン酸塩、珪酸塩、硫酸塩等の栄養塩類の存在が、「苦みの緩和」、すなわち「飲み易さ」に深い関係のあることがわかった。より具体的には、これらの塩の含有量と塩素含有量の比にかかわりがあることから、本発明では、苦味を抑え、飲み易さのみならず、独特の「こく」を有することを見出すことに成功した。本発明で規定される水は、飲み易く、かつ独特の「こく」を有することは数回にわたるモニター試験で確認することができた。

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したがって、本発明において得られる水は、そのまま飲料水として飲むこともできるが、原料水として、これに甘味料、果汁等を加えるなど加工した後に飲料とすることもできる。また、本発明の水は、種々のものに利用することが可能である。例えば、醤油、みそ等の調味料、酒類、料理水、豆腐類、漬物、料理、加工食品等々に使用することにより、独特の「こく」が出ると同時に、健康増進効果も期待できる。

【0017】本発明で規定する水を飲料や各種食品用の原料水として使用するときには、「飲み易さ」、「独特のこく」、いわゆる「味の効果」や「水の味」を十分満たすものであるが、その他の重要な効果としての健康増進効果も十分に発揮することができる。昔から、海水中のミネラル分の人体にとっての重要性は十分認識されており、例えば、海水中のミネラル分が豊富に蓄積されている海藻類が身体に良いことが昔から知られていることからわかる。学術的にも主要ミネラルの人体での役割と重要性についての研究の歴史は古く、多くのことが解明されている。また昨今は、微量ミネラルについての研究も活発に行われ、分析技術の進歩と相まって、多くのことが明らかとなってきた。これとともに、微量ミネラルの重要性も認識され、日本人の栄養所要量（第6次改訂）では、亜鉛、銅、マンガン、セレンなどの12種類のミネラルに摂取基準が定められている。ホウ素については、現在環境ホルモンの関連が問題視されているが、*

* 諸疾病との関係は十分明らかとはいえない。しかし、健康増進効果を目的の一つとする本発明の一つの因子として規定するものである。

【0018】このように、人間体内における各種ミネラルの役割、機能についての研究は進んでいるが、人体内における作用はさらに複雑である。例えばミネラルの機能についても、酵素、ホルモン、ビタミン、他のミネラルなどとの相互作用はきわめて複雑であり、ミネラル摂取の効果を理論的に十分整然と説明することはなお困難である。このために、今でも動物実験あるいは人体実験の結果から判断せざるを得ないのが実情である。本発明の水の健康増進効果について、以下の実施例で説明する。

【0019】

【実施例1】味覚試験

海洋深層水を原料とし、本文中に記載した製造方法により製造した飲料の味覚試験を実施した。試験は当社とは直接関係のない健康人モニター10人に本飲料と比較飲料を飲み比べてもらい、「飲み易さ」「苦味」を比較してもらった。ここで、比較飲料とは水道水に豆腐製造用苦汁（にがり）を加えたもので、その苦汁の添加量はマグネシウムの量を本飲料とほぼ同量になるように加えた。この両者の組成を表3に示した。

【0020】

【表3】

含有成分	本飲料	比較飲料
ナトリウム (ppm)	65.2	80.6
マグネシウム (ppm)	158.4	156.5
カルシウム (ppm)	60.1	71.1
カリウム (ppm)	59.8	56.4
亜鉛 (ppb)	1.5	1.3
銅 (ppb)	0.4	0.4
ヨウ素 (ppb)	10.3	9.6
リン (ppb)	10.1	7.8
セレン (ppb)	0.008	0.006
マンガン (ppb)	0.3	0.2
クロム (ppb)	<0.2	<0.2
塩素 (ppm)	523.1	621.3
ホウ素 (ppm)	0.1	1.2
硝酸塩・亜硝酸塩 (N原子として) (ppm)	0.13	0.02
リン酸塩 (P原子として) (ppm)	15.6	0.11
けい酸塩 (Si原子として) (ppm)	0.11	<0.01
硫酸塩 (S原子として) (ppm)	150	11

【0021】味覚試験の結果を表4に示す。

※【表4】

【0022】

※

味覚試験の結果

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9				10		
	飲み易さ			苦味		
モニター	-----			-----		
	a > b	a = b	a < b	a > b	a = b	a < b

A	○					○
B	○					○
C		○				○
D	○					○
E	○					○
F	○					○
G	○					○
H	○					○
J		○				○
K	○					○

a : 本発明飲料

b : 比較飲料

【0023】

【味覚評価】表4に示すとおり、飲み易さについては、健常者モニター10人中8人が本飲料の方が飲み易いと答え、2人が同等と答え、苦味については10人全員が比較飲料より苦味が少ないと答えた。この味覚上の差がどこから来るのかは明確ではないが、表3の組成から判断する限り、栄養塩類の量と関連性があるものと認められる。このように、深層水を原料とした水に、同じく深層水から得られる、NaClを除いたミネラル濃縮物を加えた飲料は、単に水道水に苦汁を加えた比較飲料に比較し*

【0024】

【実施例2】通院中の糖尿病患者（39才、男子）に海洋深層水を原料として、本文中に記載した製造方法により製造した飲料を1日1Lずつ飲ませ、その摂取開始前後での血糖値等を追跡した。実施例で用いた飲料の含有成分組成を表5に示す。

【0025】

【表5】

実施例2及び実施例3に使用した本飲料水の含有成分組成

含有成分	含有量
ナトリウム (ppm)	67.6
マグネシウム (ppm)	191.5
カルシウム (ppm)	65.2
カリウム (ppm)	57.7
亜鉛 (ppb)	1.4
銅 (ppb)	0.4
ヨウ素 (ppb)	9.7
リン (ppb)	10.3
セレン (ppb)	0.009
マンガン (ppb)	0.3
クロム (ppb)	<0.2
塩素 (ppm)	499.0
ホウ素 (ppm)	0.2
硝酸塩・亜硝酸塩〔N原子として〕 (ppm)	0.16
リン酸塩〔P原子として〕 (ppm)	14.1
けい酸塩〔Si原子として〕 (ppm)	0.15
硫酸塩〔S原子として〕 (ppm)	162

【0026】

【結果の評価】本実施例の飲料の摂取開始前後の血糖値、HbA1C、総コレステロール量及び中性脂肪量の変化を図1に示す。本実験の患者は、図1にあるように本実

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施例の飲料の摂取までは血糖値、HbA1C、総コレステロール量とも明らかな増加傾向にあり、いずれの値も健康者に比べると、かなり高い値であった。しかしながら、本飲料摂取後、これらの値は顕著に低下し、ほぼ正常値に達し、その後3ヶ月間はほぼ安定している。中性脂肪は一般に、摂取した食事の内容等により大きく変動し、あまり明確な傾向は認め難いが、本テストでは一応減少の傾向が認められる。

【0027】

【実施例3】本例も糖尿病の例であるが、通院中の糖尿病患者（61才、男子）に海洋深層水を原料として、表5に示す本発明の組成比の水飲料を1日700cc づつ飲ませ、その摂取開始前後での血糖値他を追跡した。

【0028】

【結果の評価】本飲料の摂取開始前後の血糖値、Hb1AC、総コレステロール及びLDL-C（悪玉コレステロール）量の変化を図2に示す。図2から分かるように、本飲料摂取開始以降、血糖値及びHb1ACは明らかに低下し、これにつれて総コレステロール及びLDL-C（悪玉コレステロール）も低下の傾向にあり、とくにLDL-Cの低下傾向は明白である。そして、この傾向は約11ヶ月間継続している。

【0029】上記実施例2及び実施例3から、糖尿病に関わる諸数値、すなわち、血糖値、Hb1AC、総コレステロール、LDL-C（悪玉コレステロール）が本飲料の摂取により改善される傾向は十分確認できる。

【0030】現在までに、糖尿病とミネラルの関係については数多く研究成果が公表されている（例えばK.H.Thompson D.V.Godin, Nutretion Res.15,NO.9,1377(1995)）。現在のところ、この両者に明確な関係が存在する *30

本飲料の血流通過時間に及ぼす影響

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*と認知されている訳ではないが、これらの多くの研究成果によって、この両者間の密接な関係が示唆されている。

【0031】したがって、上記実施例2及び3に示された結果が、本飲料に豊富に含まれるミネラルと関係があると推測することは自然である。本飲料に多く含まれる栄養塩類、本飲料の清浄性、さらにはH₂Oそのものが実施例2及び3の効果にどのような関係があるかは現時点で明らかではない。要するに、その理由を明確に示すことは困難であるが、表5に示す組成比を有する、海洋深層水を原料にして製造される本発明の飲料が糖尿病にかかわる諸数値を改善する効果が明らかに検証できた。

【0032】

【実施例4】本文中に記載した製造方法により製造した飲料水の人体の血流に及ぼす影響を、MC-FAN (Micro channel Flow Analyer; サンツリー機工社製)を用い、血流通過時間を測定することにより検証した。本例に用いた含有成分の組成は、実施例2及び3で用いたものと同じである。健康人における血流通過の平均時間は、40～60秒/全血 100μm とされているが（ヘモレオロジー研究会誌、第1巻、1998、PP53-55）、本例においては、予備試験によって飲用前の血流通過時間が60秒以上の者のみ5名を選抜し、本飲料と蒸留水各 400mlを飲用させ、1時間後に採決を行い、血流通過時間を測定した。また、被験者には本飲料を1日 500mlづつ1ヶ月間摂取して貰い、1ヶ月後に上と同様の装置と方法で血流を測定した。測定結果を表6に示した。

【0033】

【表6】

被験者		通過時間（秒／100 μm）		
		飲料前	飲用1時間後	飲用1ヶ月後
A	本飲料水	49.1 ± 2.8	41.2 ± 2.2	43.2 ± 2.5
	蒸留水	49.1 ± 2.8	48.7 ± 2.6	51.3 ± 2.6
B	本飲料水	55.1 ± 2.9	47.4 ± 2.3	46.5 ± 2.8
	蒸留水	55.1 ± 2.9	51.8 ± 2.2	52.1 ± 2.7
C	本飲料水	61.9 ± 2.9	50.3 ± 2.6	48.5 ± 2.3
	蒸留水	61.9 ± 2.9	62.3 ± 3.0	61.7 ± 2.6
D	本飲料水	60.4 ± 2.6	52.1 ± 2.4	51.8 ± 2.3

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蒸留水	60.4 ± 2.6	61.1 ± 2.9	60.0 ± 2.4
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本飲料水	62.3 ± 2.4	51.8 ± 2.7	50.6 ± 2.5
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E

蒸留水	62.3 ± 2.4	62.7 ± 2.5	63.2 ± 2.6
-----	------------	------------	------------

【0034】

【結果の評価】上記表6によれば、統計的にも「有意差あり」(P<0.05)と判定され、血流に対する本発明の飲料水の明白な効果を示すものである。血流不良は、人体の健康の根源にかかわるものであり、特に人体の微小循環系との密接な関係が指摘されている。したがって、本発明の水は、微小循環系の不良によって起こると考えられる、「肩こり」、「眼精疲労」、「冷え性」、「高血

* 庄”等の症状に対し有効と考えられる。

【0035】

【実施例5】本例では、本文中に記載した製造方法により製造した飲料水の飲用によるアトピー性皮膚炎に及ぼす影響について検討した。本例に用いた飲料水の含有成分の組成は表7に示したとおりである。

【0036】

【表7】

含有成分	含有量
ナトリウム (ppm)	70.9
マグネシウム (ppm)	193.7
カルシウム (ppm)	61.1
カリウム (ppm)	58.8
亜鉛 (ppb)	1.4
銅 (ppb)	0.3
ヨウ素 (ppb)	10.0
リン (ppb)	9.6
セレン (ppb)	0.008
マンガン (ppb)	0.3
クロム (ppb)	<0.2
塩素 (ppm)	512.4
ホウ素 (ppm)	0.2
硝酸塩・亜硝酸塩 (N原子として) (ppm)	0.17
リン酸塩 (P原子として) (ppm)	15.0
けい酸塩 (Si原子として) (ppm)	0.16
硫酸塩 (S原子として) (ppm)	166

【0037】本実験における試験対象は、湿疹、皮膚炎の5例とし、被験者には本飲料水を1日500m2ヶ月間継続飲用してもらった。効果の判定は、2週間後、4週間後、6週間後、8週間後に行い、掻痒、紅斑、角化、鱗屑、皸裂及び総合所見を観察し、有効性を4段階(+++：※40

※極めて有効、++：有効、+：やや有効、-：有効とは思われない)で判定した。結果を表8に示す。

【0038】

【表8】

本飲料水のアトピー性皮膚炎に及ぼす影響

経過	被験者 A	被験者 B	被験者 C	被験者 D	被験者 E
2週間後	-	+	++	++	++
4週間後	+	+	++	++	+
6週間後	+	+	++	++	+++

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8週間後 - - + + ++

【0039】

【結果の評価】表8から、本飲料水飲用によるアトピー性皮膚炎への有効性は明らかである。本発明における特定組成のミネラルを含む水飲料が、1日一定量の飲用によって、アトピー性皮膚炎に対して明らかな治療効果を示す。

【0040】

【発明の効果】本発明の実施例1～5に示す飲料水が、

1) 海水から得られる他のミネラル補給飲料に比較して飲み易いこと、2)糖尿病及びそれに関連する健康上の諸*

* 数値（例えばコレステロール）を明らかに改善すること、3)多くの疾病の根源と見なされる血流を改善すること、4)飲用によって、アトピー性皮膚炎に効果が見られることは明らかである。

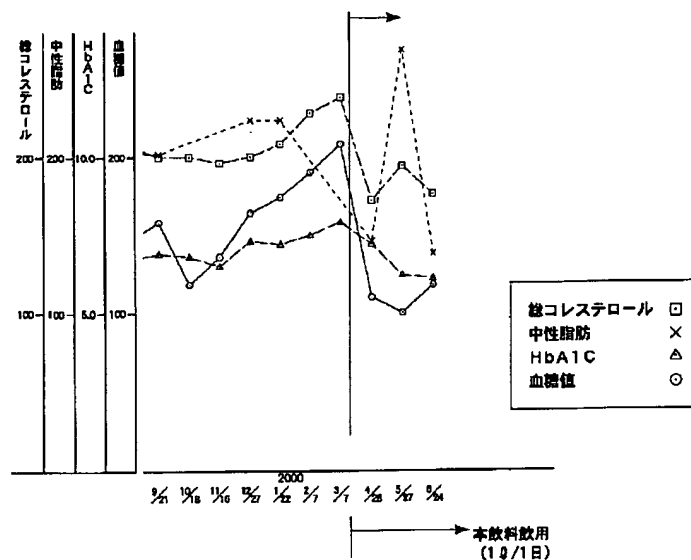
【図面の簡単な説明】

【図1】本発明の飲料摂取前後の血糖値、HbA1C、総コレステロール量及び中性脂肪量の変化

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【図2】本発明の飲料摂取前後の血糖値、HbA1C、総コレステロール量及びLDL-C(悪玉コレステロール)の変化

【図1】

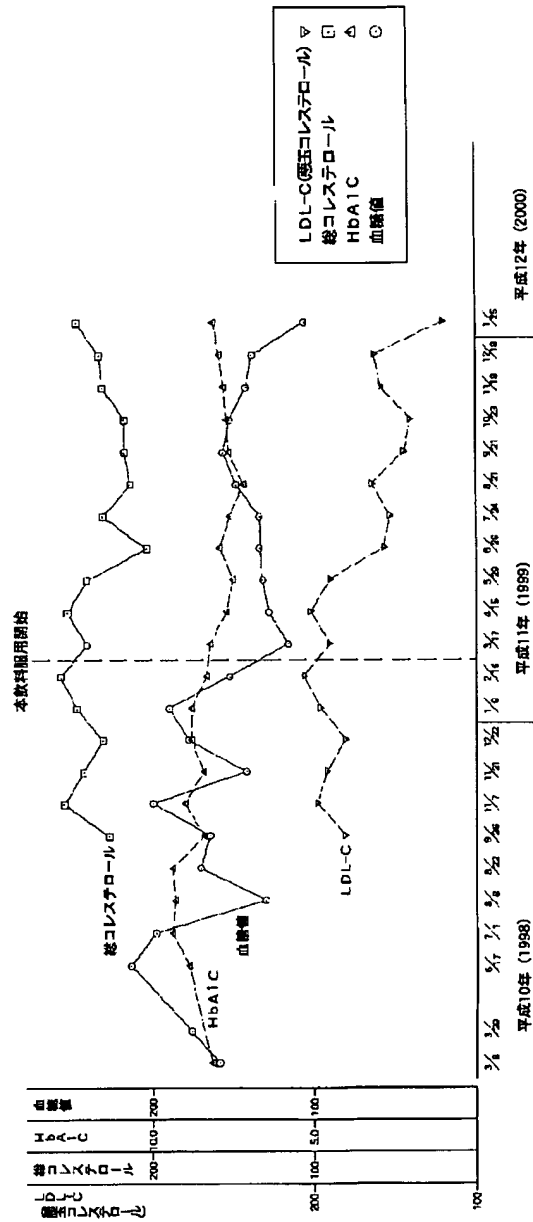


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〔図2〕



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Fターム(参考) 4B017 LC03 LK02

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